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Alsos

General Mission

Article by V. Gilansen, relating to
U.S. military intelligence,
including Alsos mission, during

WW II, 1962

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From the History of U.S. Military - Technical Intelligence in World War II - V. Gilensen

The rapid development of combat materiel and new weapons types during World War II considerably broadened the task of intelligence. The success of front-line operations depended to a great extent on obtaining timely and accurate information about the enemy's arms, as well as on the course and direction of his scientific research in the realm of new weapons types and new models of heavy equipment. Receipt of such information would ensure against unexpected surprises by the enemy and would permit time for effecting necessary countermeasures. All of this increased the importance of scientific-technical intelligence and led to recruitment of highly qualified scientific-technical personnel for the fulfillment of these tasks.

In connection with the above, of considerable interest is the activity of the American intelligence group ALSOS and certain other U.S. intelligence organizations of similar purpose. During the first period, from approximately 1943 to the Fall of 1944, their main task was to acquire, through all possible means, accurate information on German work in building the atom bomb and other secret weapons types. At the end of the war the principle activity of these organizations changed to encompass the capture of German scientific research works of a military nature as well as the capture of scientific personnel and special equipment, the purpose being to use Germany's military-technical secrets in the interests of American imperialism in the post-war period. The American ruling organs also strived to prevent information on German research, particularly in the atomic weapons field, from falling into the hands of their then Allies in the anti-Hitler coalition, especially the U.S.S.R.

The method of conducting scientific-technical intelligence by use of special groups was first tried by the Americans in Italy after the Allied landings.¹ A small group of American scientists and military intelligence personnel was sent there to capture the Italian scientists and engineers who had participated along with some Germans in scientific research of a military nature at the University of Naples and other scientific centers. The group was given the code-name ALSOS. The Chief of the group was the American intelligence officer Colonel B. Pash. The group consisted of representatives of Army and Navy intelligence, people from the Office of Scientific Research and Development, and representatives of General Groves' command.² The experience gained by this group was intended to serve in the future for organizing similar measures on a larger scale after the Anglo-American troop landings in France.

1. Science in World War II. Office of Scientific Research and Development. Boston, 1947, p. 165.

2. In World War II, Groves headed up a special command created to direct work on the "Manhattan Project" (construction of the U.S. atom bomb).

The activities of the ALSOS group were not substantially successful in Italy, inasmuch as the Germans had not confided to their Italian allies any secret data about their work in the field of new weapons types. Nevertheless, Washington considered that the basic principle underlying the organization of the group had been proven correct.

At the end of 1943, in connection with the forthcoming "Operation Overload", a decision was made in the Pentagon to form a combined intelligence unit, based on the ALSOS group, to conduct operations in Europe after the Allied landings. It was proposed to assign to the group professional intelligence officers as well as highly qualified scientific workers and engineer-technical personnel.

After the return of the ALSOS group from Italy in February 1944, training and dispatch to Europe of the large scientific intelligence unit was commenced. The unit kept the original name.³

The scientific-technical portion of the group's activity was headed up by the well known Dutch-born atomic physicist, Professor S. Goudsmit. Thanks to his personal acquaintance with most of the important German physicists, his considerable stature in scientific circles and his knowledge of a number of European languages, he was considered the most qualified candidate for the job of the group's scientific director.

Observation and control of the group's activity was lodged in a special inter-agency committee in Washington, composed of representatives of the different organizations cooperating in the organization of the group.⁴

The primary mission assigned to the ALSOS group was the collection of intelligence information on German work in construction of an atomic weapon, the seizure of German institutions which were conducting scientific research work of military significance, and seizure of their equipment, their principal collaborations and their technical documents. The ALSOS command was also expected to give special attention to collection of data on German research in the field of rocket technology, radar, proximity fuzes and bacteriological warfare. In this connection,

3. S. Goudsmit, "Alsos", New York, 1947, p. 10. The Goudsmit book, "The Alsos Mission", will be published in translation in the near future by GOSATOMIZDAT.

4. At the beginning, a Navy representative, Commodore Shade, was also included in the mission. Later, in connection with the Navy's formation of its own scientific intelligence group in Europe, he was recalled and named chief of the Navy group. From the very start the Army Air Corps took no part in the work of the ALSOS group. This was due, in all likelihood, to the well-known rivalry which is characteristic of the interrelationships among Army, Navy and Air commands in the armed forces of the capitalist countries. This perforce led to a certain degree of duplication in the activity of the intelligence activities of the various U.S. agencies.

5. Science in World War II, p. 167.

the group's scientific personnel included representatives of many departments of the Office of Scientific Research and Development.⁶ In addition, there were assigned as required individual specialists of private firms, universities and other organizations to serve as experts in their respective fields.

Among the objectives of the scientific personnel, who were directly subordinate to Professor Goudsmit, was the analysis of all preliminary data on the development of German science and technology. Basing on available information, the scientific workers were supposed to determine the areas, institutions and people who might be of interest for collection of intelligence material. On the basis of these "requisitions" Colonel Pash and his American military intelligence subordinates were expected to assure the capture of the assigned targets before the arrival not only of Allied troops but of U.S. troops as well. They were also expected to search for and arrest individuals of interest to the group's scientific personnel. Part of the duties of the military intelligence officers was to supply the scientific workers with intelligence information obtained by other organs of the secret service of the U.S. and Britain. A special representative of General Groves was included in the group, an intelligence Major with the privilege of direct contact with leading American and British officials.

The organization and system of supply of the ALSOS group permitted it to obtain provisions and all necessary supplies from any American storage point, and it was thus able to operate completely autonomously. The group was directly subordinate to Washington. In case of necessity it maintained liaison with Headquarters Allied Expeditionary Forces in Europe and was entitled to support from it. Its activity was conducted in complete secrecy, and only a limited number of individuals in the Anglo-American command knew its true missions. In addition, these missions were not revealed to the group's administrative personnel. ALSOS personnel were entitled to conduct operations in any area of interest to them, without the need to keep anyone advised. All the group's vehicles carried a special symbol - the Greek letter "Alpha", and they could move about freely in the allied zone without being subject to control.

The group's operational activity began at the end of August 1944, after the German withdrawal from Paris. The first target of its "investigation" was the well-known laboratory of the French physicist,

6. In the summer of 1947, the U.S. organized the so-called National Defense Research Committee. Later it came under the direction of the Office of Scientific Research and Development. The latter agency employed about 6,000 scientific workers - physicists, chemists, engineers, doctors, psychologists - in carrying out a broad program of research and design activities for military purposes. The nature of the activity of the OSRD will be clear from its organization: The nineteen departments were concerned with problems of ballistics, guided missiles, explosives, radar, submarine warfare, optics, camouflage, military metallurgy, physics, chemical mechanics, etc. (Science in World War II, p. 164).

7. S. Goudsmit. Op. cit. p. 18.

Professor Joliot-Curie.⁸ However, neither study of the documents left by the Germans after their flight nor talks with Joliot-Curie and other scientists provided any new data on German work in the field of creation of an atomic weapon.

During the following weeks the members of the ALSOS group conducted several raids on the offices of subsidiaries of German firms in France. Special attention was given to study of the activities of the well-known "Siemens" concern. Information was available indicating that a cyclotron had been built in its plants, and it seemed likely that Siemens was participating in the work of the "Uranium Union". The building occupied by the Siemens representative in France yielded no documents pertaining to nuclear research. However, analysis of the material found there (stenographic records of business talks, clients' addresses, correspondence with French firms concerning shipment of electrical equipment, personnel pay-rolls) provided the clue for conducting a series of measures which were grouped together under the code-name "Operation Sellastic".

Among the papers found in the building of the Siemens concern there was mention of the name of a French engineer who had been working in the radar field for the German firm. They succeeded in finding him and he provided some interesting information. He stated that during the German occupation he had filled orders for a Dutch firm "Sellastic". According to him, this concern was merely a cover for a German intelligence organization. The dummy firm used citizens of neutral countries as cover collaborators, employing for the most part Swedish citizens, and actually collected information on important new inventions and on the personalities of the inventors. The firm's office was on the Champs Elysee in Paris, in a building which had previously belonged to the Venezuelan Embassy. Investigation of the building revealed a large library abandoned by the firm's personnel, as well as a great many documents. Study of this material revealed the secret activity of "Sellastic". By examining the library stocks they were able to learn that the former owners had been interested mainly in the exact sciences. The doorman's register contained a list of names and addresses of the French businessmen who had visited the firm. The desk calendar yielded notes in Dutch about visits of firm personnel to the Sorbonne laboratory and to certain important French scientists. Of considerable interest were certain data contained on used sheets of carbon paper found in the trash baskets.

By questioning a book dealer who had supplied scientific literature to the firm, they were able to learn the address of one of the former employees in the Sellastic office, a Dutch physicist. His interrogation enabled them to gain a clear picture of the firm's activities. It turned out that it had belonged to an old German intelligence agent by the name of Kleist, who had turned it over to the Hitlerites as a cover for conducting technical espionage. One of the directors of the organization

8. After the occupation of Paris in 1940 Joliot-Curie was visited by two German physicists who occupied important posts in the so-called "Uranium Union", Professor Schumann and Doctor Diebner. Initially, they wanted to disassemble the cyclotron and other apparatus in the laboratory and send it

was chemistry Professor Grieger, a collaborator of German military intelligence (Abwehr). The firm's emissaries collected information on French inventions and scientific research work of a military-economic character. By carefully concealing their real functions, they were able to induce the inventors to collaborate with the occupying forces in such a manner that they frequently did not realize what they were doing. Sellastic had a good-sized agent network. One of the most valuable agents was a woman physicist from the Sorbonne, a certain Madame Tetescu, who provided information to the Germans on the activity of this, the greatest French scientific center. She was also used to establish contact with the French scientists whose research was of interest to the Germans.

In summary, "Operation Sellastic" resulted in the uncovering of a large German intelligence organization. But the scientific-technical information obtained turned out to be of secondary importance.

Along with their efforts to find material on German work in nuclear physics, during this period in France the ALSOS group conducted lively activity in other fields as well. Thus, one of the group's experts, Dr. Noyes, carried out a detailed investigation⁹ of French chemical industry plants which had filled German orders. He established the fact that the Hitlerites had worked feverishly in preparing for chemical warfare, but had not entrusted any secret data in this field to the French specialists.

Another of the group's scientific workers, a specialist in rocket technology, investigated a number of French regions and finally found a plant for production of the F-2 rocket in an abandoned coal mine near Verdun. In this underground plant over 3,000 workers, peaceful citizens of the occupied countries who had been forcefully deported, were working night and day under the supervision of 500 Germans. There were young children among these workers. In order to effect a detailed investigation of the German plants and design bureaus connected with rocket production, the National Advisory Committee for Aeronautics dispatched a large group of specialists to the European Theater, and their work continued over a period of a number of months. In the woods near Braunschweig they located a carefully camouflaged airplane factory previously unknown to American intelligence. To conceal the factory from air observation the Germans had built a platform above the air-shaft and had covered it with soil and planted trees and bushes. The Americans did not find a single air bomb crater anywhere near the plant.

(Continued)

to Germany, but they later gave up this idea. Direction of scientific work in Joliot-Curie's laboratory was completely given over to a German physicist who brought with him a staff of German scientific workers. It should be noted that Joliot-Curie risked his life to use the laboratory equipment for making explosives for French Resistance fighters, all under the very noses of the Germans.

9. Science in World War II, p. 161.

Metallurgical specialists of the ALSOS group collected data on German achievements in making cutting tools of high durability.

After the Allied troops occupied Strasburg in November, 1944, the ALSOS group was finally able to learn the secrets of the research and experiments conducted by German atomic scientists under orders of the Hitler regime. Here in Strasburg the group conducted one of its most important operations, under the code name "Jackpot". Even before the fall of Strasburg the ALSOS group had obtained material indicating that the old French university located in the city had been turned into a center for military research work. As a result of a visit to the director's office of one of the French firms producing optical instruments it was learned that the well-known German physicist Fleischman had recently been working in the Strasburg University laboratory. After the Dutch electrical firm "Philips" had fallen into Allied hands in Holland, information was obtained about orders effected by Strasburg University for new equipment for atomic research, also about an increase in the university's staff of scientific workers. It was assumed that one of the outstanding German theoretical physicists, Von Weiszecker, a relative of the well-known Hitlerite diplomat was also in Strasburg. Analysis of the university's study plans available in the files of the Paris branch of American strategic intelligence showed that one of the leading German virus specialists, Professor Haagen, a man close to the leaders of the Nazi party, was also working in Strasburg. This indicated that work might be carried on in Strasburg for preparation of bacteriological warfare.

An operational group composed of ALSOS people under command of Colonel Pash entered Strasburg along with the advance guard Allied elements on 15 November 1944. Weiszecker and Haagen managed to evacuate, but Fleischman was captured. A considerable part of the equipment in the university laboratories remained undamaged. The Germans did not have time to destroy many valuable documents. In Fleischman's possession were found stenographic notes of a number of secret meetings with other German atomic physicists. He had scrupulously recorded information in his notebook about well-known German physicists and the problems which they were working on. As a result of study of other documents captured in Strasburg it was possible to arrive at an approximate picture of the organization of German scientific research in the war period, particularly with respect to progress in research and experimental work in nuclear physics. It was learned that the most important center of atomic research was in the Kaiser Wilhelm Institute in Berlin, but that it had been evacuated due to air bombing to the village of Echingen in southern Germany. They found some of the computations on the theory of atomic reactors. But there was no indication from the documents that the Germans had succeeded in effecting an atomic explosion or in creating radioactive toxic agents. Study of the documents also revealed that the German physicists had not found a high-yield method for separation of uranium U-235. The general conclusion arrived at by Professor Goudsmit was that the Germans, although intensively working

on construction of an atomic weapon, were still at one of the early stages, corresponding more or less to the level of U.S. research in 1940, that is, prior to the start of active work in the so-called Manhattan Project.

The summary report prepared by the ALSOS group after investigation of Strasburg University had been completed also contained data on German work in the field of subsonic and supersonic flight, gas turbine design, proximity fuzes, radar, optical instruments and preparation for bacteriological warfare.¹⁰ It was also learned that Professor Haagen had conducted monstrous "experiments" with prisoners of war. The SS personal representative of Himmler, professor of anatomy Kirt was responsible for maintaining a constant supply of concentration camp prisoners for these "experiments". A letter was found addressed to Himmler complaining about the fact that out of 100 prisoners of war sent to them, 18 had died enroute and the others had become so weak that only 12 were usable for the "experiments".¹¹

The Strasburg operation helped to establish definitively the location of the main German center of atomic research, directed by Professor Werner Heisenberg. An air photograph of the village of Echingen showed that the laboratory occupied one wing of a small textile factory. This led to the conclusion that the work was not of broad scope, and the American command did not consider it necessary to bomb this target in order to destroy it. The leaders of the ALSOS group decided to organize an operation to seize the laboratory personnel, its equipment and its scientific documents.

In mid-March 1945, the ALSOS group, following the Allied troop advance to the East, arrived at Heidelberg with its very old university. The principal target of the ALSOS group was one of the Kaiser Wilhelm Institute laboratories, directed by Professor Walter Bothe, a well-known German atomic physicist who had been released from the university as a result of intrigue. Goudsmit knew Bothe personally and had a talk with him. He also examined the laboratory documents and its cyclotron, but he was unable to obtain any new data. The material from the Heidelberg University laboratories also failed to yield any positive results. In Heidelberg the ALSOS group interrogated the director of the Kaiser Wilhelm Medical Institute, the important organic chemist Dr. Kuhn. The interrogation failed to produce any substantial results, but later, through Dr. Kuhn, the group was able to obtain valuable material on German research in the field of military chemistry, the techniques of production of asbestos, plastics, aluminum, etc.

Meanwhile, ALSOS Headquarters which was still located in Paris received information that the American troops under General Patton's command were approaching central Germany and were drawing near to the

10. Science in World War II, p. 170

11. S. Goudsmit. Op. cit. p. 75.

small village in Thuringia where, according to intelligence reports, the evacuated laboratory of Professor Diebner was located. Diebner was supposed to be one of the directors of German work in building the atomic weapon. With him was working another well-known German atomic physicist, Walter Gerlach. Operational and scientific personnel of ALSOS were flown in by plane and arrived in the village, which was not occupied by German troops, two days before its capture by the Americans. But they didn't find either Diebner or Gerlach. Shortly before, Diebner and Gerlach had been evacuated under heavy SS guard, taking with them the laboratory workers and everything needed to continue their work. It was assumed that they had gone to Bavaria, where the Hitlerites were planning to form their last defensive stronghold. Among the documents found was a report by Gerlach containing detailed information on the results of his research and experiments. Analysis of this report again confirmed the conclusions reached after the Strasburg operation, that is, that the Germans did not have an atomic weapon and were very far from solving the problem of its construction.

After the Strasburg and Heidelberg raids, one important detail of German nuclear research remained unclear: had the Germans achieved any success in obtaining the uranium isotope U-235 by the centrifuge method, this isotope being necessary for building the atom bomb? The Americans also did not know in which laboratory and in what area these experiments were being conducted. The capture of the Diebner laboratory solved this problem. It was established that the experiments for separating uranium isotopes by the centrifuge method were being carried out in Hamburg under the direction of Professor Hartek. The laboratory had been forced to move three times due to air raids, and had finally settled in the little town of Celle near Hanover. In mid-April 1945 Professor Goudsmit and a small group of ALSOS personnel arrived in Celle and found Hartek's laboratory in the building of a former parachute-silk factory. The centrifuge experiments had been conducted on a small scale, and their purpose was not to obtain the pure uranium isotope U-235, but merely to produce a uranium isotope mixture richer in this isotope than that found in its natural state. The German scientists believed that if they were able to do this it would be easier to make an atomic reactor under conditions of limited supply of heavy water. In view of the fact that they had only one centrifuge working, Professor Goudsmit calculated that it would have taken the Germans about one hundred years to achieve any tangible results.¹²

At about the same time the ALSOS group captured an important part of the controlling element of the so-called Imperial Research Council along with its chief, Ozenberg. This was the organ which directed all scientific research of a military-economic nature in fascist Germany during World War II. This operation also resulted in the capture of

12. S. Goudsmit. Op. cit. p. 94

numerous documents relating to research in the fields of chemistry and aeronautics.

The target of the last large-scale ALSOS operation (which had the code-name "HUMBUG") was the main center of German atomic research in Southern Germany. Here, in the village of Hechingen near Stuttgart was located the laboratory of a leading German atomic physicist, Werner Heisenberg. Not far away the second most important German physicist Otto Hahn had settled in the village of Teiflingen. Other important scientific research organizations had also been evacuated to this area. The Swiss physicist Dellenbach, who was working on a cyclotron of new design, had a laboratory here under the name of "Research Center D". Here also were located the biology and metallurgy sections of the Kaiser Wilhelm Institute.

The Americans hurried to reach these targets since the areas were due to become part of the French occupation zone, and Washington did not want their French allies to learn the German scientific-technical secrets. Colonel Pash planned a special parachute drop in the area, but after consultation with Washington it was decided to stick with the overland method. In order to carry out this operation a company of American troops who had been specially trained was attached to the group, as well as two armored troop-carriers. Colonel Pash and Professor Goudsmit were accompanied by a representative of American military intelligence, General Harrison. The Americans succeeded in capturing the leading German atomic physicists, Otto Hahn, Von Weiszecker, Von Lave, a large quantity of documents, 2 tons of uranium and 2 tons of heavy water.¹³ A few days later Werner Heisenberg was also found in the little village of Ufeld near Munich. In Munich itself the Americans captured Walter Gerlach, and they caught Diebner in Thuringia. Soon Professor Hartek also was delivered to Paris.

Thus, the activities of the ALSOS group resulted in delivering into American hands the principal group of German atomic physicists, the scientific documents relating to the results of their research, as well as the equipment and materials which they had been using for their atomic experiments. They had also learned the location of German radium supplies and had organized their seizure.

The group's scientific workers, led by the physicist Dr. Salant, gathered a great deal of material on German experiments in design of proximity fuzes. The American high command evinced great interest in this problem. It was discovered that the Germans had not gone beyond experimental models.

13. S. Goudsmit. Op. cit. p. 105.

The ALSOS group also collected a lot of material on other German work which was not only of military importance but also of interest for American firms in their competition for world markets.

During the final stage of its activity the main task of the ALSOS group was translation, analysis and commentary of a tremendous quantity of captured documents containing scientific-technical information. The group was disbanded at the end of 1945.

During the final stages of World War II the Americans created other intelligence organizations of the ALSOS type for action in the European and Asian theaters. For example, in the winter of 1944 the "Navy Technical Group in Europe" was formed. In its activities it maintained contact with the ALSOS group and it established branches in England and other countries. Its personnel captured a large quantity of material dealing with German use of rocket technology in its naval forces. They also devoted considerable attention to problems of military psychology, in particular the study of German methods of selection and training of Navy personnel in the German Naval training school on the Baltic.

At the end of World War II the U.S. established the so-called Committee for Technical Industrial Intelligence.¹⁴ Its purpose was to coordinate the operations of the various American intelligence organs collecting scientific-technical information. The committee consisted of representatives of various agencies: Army, Navy, and Air Intelligence, the Federal Economic Administration, OSS, Office of War Production, Department of State, and Department of Scientific Research. Its mission included conduct of "Technical industrial intelligence (collection of information on production and machinery); "scientific intelligence" (material on scientific research for purposes of development of production); and "military-technical intelligence" (characteristics and employment of finished products)¹⁵. The division of responsibility between these types of scientific-technical intelligence was highly conventional.

The information collected by the Committee for Technical Industrial Intelligence was to be disseminated to interested military and other government agencies, and was also to be given to American industrial companies. The scope of its activities will be evident from the fact that up to 500 important American specialists in various branches participated in the operations conducted in Europe by intelligence groups under its control. They had enrolled specialists in rocket technology, synthetic rubber production, chemicals and synthetic materials, plastics, medicinals, machine-tool construction and the textile industry, metallurgy, etc. The organization of their operational groups permitted them to work absolutely autonomously; troop units were attached to the groups by the Allied command.

14. Science in World War II, page 75.

15. Ibid.

The coordination of the activity of the Committee for Technical Industrial Intelligence with the work of British Intelligence was effected by the Combined Intelligence Subcommittee under Headquarters, SHAEF.

It should be noted that after the Allied landings in Europe other military-technical intelligence groups were dispatched to France (for example, by the Army Quartermaster Dept., Army Strategic Air Command) and these groups collected scientific-technical information independently of the Committee for Technical Industrial Intelligence, ALSOS, and other organizations.

The American intelligence operatives effected a broad-scale examination of German industrial enterprises, particularly those of strategic significance. For example, for the period 3 to 23 May 1945 alone, personnel of the Production Section of the American Office of Aeronautics (Nat'l Adv Com for Aeronautics) examined many large German industrial establishments. Among these were the Leitz plants (radio equipment), the plants of the well-known Zeiss in Yena, the Langheim-Pfauhauser establishment in Leipsig (electrochemical equipment and chemicals), the Mitteldeutsched Motorenwerke in the same city (airplane engines), the Horne plants also in Leipsig (airplane engines), the Junkers plants in Dessandand Ascherleben, the underground factories of Askaniawerke in Merzeleben (airplane instruments and automatic pilots,) Siemens in the same area (automatic pilots, electric motors, torpedo parts), Winkle-Zeiss and Schneider in Goettingen (optics), the experimental plant of Fokkee-Wulf in Detmold, and the underground factories of Mittelwerke-Nordwerke in Niedersachswerft (V-1 and V-2).

While they "investigated" these establishments the Americans seized and dispatched to the U.S. technical documents as well as partially completed or finished parts, particularly parts of the ballistic missile V-2 and its apparatus. This, the American rocket proving-grounds at White Sands, New Mexico alone received 50 V-2 warheads, 115 instrument sections, 127 fuel compartment assemblies, 100 thrust frames, 90 tail-section assemblies, etc.¹⁶

About 300 freight-car loads of equipment and rocket parts were removed from the underground factories for production of the V-1 and V-2 in Niedersachswerft, which was to become part of the Soviet occupation zone.

The Americans captured a huge quantity of scientific-technical documents in Germany, including hundreds of thousands of patents. The storage warehouses of Wright Field along (the American Central Scientific Research Station) received German secret scientific documents amounting to a total weight of 1500 tons.¹⁷ These materials contained data on a great variety

¹⁶W. Ley - "Rockets in Flight and in Space." Mr. Voenizdat, 1961, pg. 205.

¹⁷ "Conclusions of the Second World War." M. Foreign Language Publishing House, 1953, page 336.

of matters pertaining to nuclear physics, rocket technology, production of explosives and toxic substances, radio technology, guidance systems, metallurgy, production of synthetic rubber and textiles, etc. The total value of the German technical documents which fell into the hands of the Western allies, mostly the U.S.A., is estimated at approximately 1500 billion marks.¹⁸ Of great importance were the materials captured by the Americans from the laboratories and plants of the I. G. Farbenindustrie. One American report revealed that "We obtained the most valuable secrets from the Barben laboratories and plants . . . These secret data relate to production of liquid and solid fuel, the metallurgical industry, production of synethetic rubber, textiles, chemicals, synthetic fibers, medicinals and dyes. One American specialist in the field of dye-stuff production stated that the German patents contained methods and formulae for producing 50,000 types of dye substances, the majority of them better than ours. We would probably never have been able to produce some of them by ourselves. The American dye industry has moved forward by at least 10 years."¹⁹

The American Army organized special troop units to capture and dispatch to the U.S. qualified German technical specialists and scientists. At the end of the war one of these units conducted a special operation under the code name "Paperclip." This was in actual fact a round-up of German specialists in the rocket construction field. They seized the buildings of all important German industrial and research establishments engaged in production and development of rockets, and they removed their technical-scientific documents.²⁰

According to data of the U.S. Department of Defense, by December 1947 523 German scientists had been brought to the U.S., and their number finally increased to 1000. Among these were 125 German rocket specialists.²¹ Some of them, including the main designer of the V-2 Wemer von Braun, are still working in the U.S.

The Americans derived tremendous advantage from German rocket construction. "We were novices when they delivered the V-2 rockets to us from Germany. They enabled us to obtain information which saved us more than 5 billion dollars and 10 years of research work." This statement was made by American Brigadier General Toffey shortly after the war.²²

Many models of American military armament, primarily rocket weapons, were built after World War II with the help of German specialists, basing on German designs or experiments previously conducted in Germany.

¹⁸ R. Juser. "German Weapons and Secret Weapons in World War II and Their Further Development." Munich 1959 S. 253.

¹⁹ "Conclusions of the Second World War," page 348.

²⁰ R. Lusar, Op. Cit. S. 253-254.

²¹ Ibid. S. 163

²² Ibid.

For example the captured flying missile V-1 scored as the base for development of the American designed "Regulus," "Navaho," "Snark," "Matador A" and "Metador B." On the basis of the V-2 rocket the Americans built the "Corporal," "Atlas," "Viking," "Redstone" and "Bumper." The Americans also used the results of German experiments for launching ballistic missiles from submarines.

At the end of 1944 the German engineer Bachem designed the flying missile "Natter" to use against the allied 4-motor bombers. Three specimens of this missile fell into American hands and served as the basis for development by the Convair and Lockheed firms of the experimental planes XGY-1 and XFY-1.²³

In the plant of the Henschel firm a winged bomb (HS-293) was designed at the end of the war under the direction of Professor Wagner. Tests were conducted for remote guidance. All the research materials and technical documentation for this weapon type were captured and used by the Americans. The American air-to-air missiles "Mighty Mouse," "Falem," and "Gorgon" were built on the basis of the results of German work in building rockets of the same class (R-4M--"Orkan").

The Americans did not limit themselves to using the achievements of German rocket technology. They borrowed a good deal also in the field of airplane construction. Certain American helicopters were designed on the basis of experiments conducted in the "Flettner Flugzeugbau" plants. Further development was made of research in construction of "beetles" and vertical ascent airplanes, also of the bombsight with automatic computer E2-42, rifles for firing from around a corner ("Eckgewehr"), the machine-pistol, "Sturmgewehr-44," etc.

In all of the above, American military-technical intelligence played a great part.

²³Ibid. S. 130-131.